REMARKS

The Office Action dated February 8, 2006 has been received and considered. In this response, claims 10-12, 22-50 and 60-62 have been canceled without prejudice or disclaimer, claims 1, 13, 51, 63 and 66 have been amended, and new claims 71-78 have been added. Reconsideration of the outstanding rejections in the present application is respectfully requested based on the following remarks.

Amendments to the Claims

As indicated by the Office Action, claims 12-14 and 62-64 would be allowable if rewritten in independent form including the subject matter of any intervening claims. In the interest of placing the present application in better condition for consideration on appeal, claim 1 has been amended to recite all of the additional subject matter of allowable claim 12 and intervening claim 10 and claim 51 has been amended to recite all of the additional subject matter of allowable claim 62 and intervening claim 60. Although the text of claims 10 and 12 was not added *verbatim* to claim 1 and the text of claims 60 and 62 was not added *verbatim* to claim 51 so as to avoid unwieldy wording for claims 1 and 51, claims 1 and 51, as amended, recite the same subject matter and have the same scope as allowable dependent claims 12 and 62, respectively. Thus, the amendments to claims 1 and 51 do not require additional searching or consideration on the part of the Office, and entry of these amendments therefore is respectfully requested. In view of these amendments, it is submitted that claims 1 and 51 are allowable at least for the reasons that claims 12 and 62 are allowable. Claims 2-9, 11, 13-20, 52-59, 61, and 63-70 also are allowable at least by virtue of their dependency from one of allowable claims 1 and 51.

New claims 71-78 have the same scope as previously presented claims 3, 7-9, 53, and 57-59, respectively. Accordingly, new claims 71-78 do not require additional searching or consideration on the part of the Office. Entry of these amendments therefore is respectfully requested.

Enablement Rejection of Claims 11, 17-21, 61, and 67-70

At page 2 of the Office Action, claims 11, 17-21, 61, and 67-70 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. This rejection is respectfully traversed.

As stated by the M.P.E.P,

> [t]he purpose of the requirement that the specification describe the invention in such terms that one skilled in the art can make and use the claimed invention is to ensure that the invention is communicated to the interested public in a meaningful way. The information contained in the disclosure of an application must be sufficient to inform those skilled in the relevant art how to both make and use the claimed invention. However, to comply with 35 U.S.C. 112, first paragraph, it is not necessary to "enable one of ordinary skill in the art to make and use a perfected, commercially viable embodiment absent a claim limitation to that effect." *CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333, 1338, 68 USPQ2d 1940, 1944 (Fed. Cir. 2003) (an invention directed to a general system to improve the cleaning process for semiconductor wafers was enabled by a disclosure showing improvements in the overall system). Detailed procedures for making and using the invention may not be necessary if the description of the invention itself is sufficient to permit those skilled in the art to make and use the invention. A patent claim is invalid if it is not supported by an enabling disclosure.
>
> The enablement requirement of 35 U.S.C. 112, first paragraph, is separate and distinct from the description requirement. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1116-17 (Fed. Cir. 1991) ("the purpose of the 'written description' requirement is broader than to merely explain how to 'make and use'"). *See also MPEP* § 2161. Therefore, the fact that an additional limitation to a claim may lack descriptive support in the disclosure as originally filed does not necessarily mean that the limitation is also not enabled. In other words, the statement of a new limitation in and of itself may enable one skilled in the art to make and use the claim containing that limitation even though that limitation may not be described in the original disclosure. Consequently, such limitations must be analyzed for both enablement and description using their separate and distinct criteria.
>
> Furthermore, when the subject matter is not in the specification portion of the application as filed but is in the claims, the limitation in and of itself may enable one skilled in the art to make and use the claim containing the limitation. When claimed subject matter is only presented in the claims and not in the specification portion of the application, the specification should be objected to for lacking the requisite support for the claimed subject matter using Form Paragraph 7.44. See MPEP § 2163.06. This is an objection to the specification only and enablement issues should be treated separately.

M.P.E.P. § 2164 (emphasis added).

With respect to the burden on the Examiner for a rejection based on the enablement requirement, the M.P.E.P. provides that

> [b]efore any analysis of enablement can occur, it is necessary for the examiner to construe the claims. For terms that are not well-known in the art, or for terms that could have more than one meaning, it is necessary that the examiner select the definition that he/she intends to use when examining the application, based on his/her understanding of what applicant intends it to mean, and explicitly set forth the meaning of the term and the scope of the claim when writing an Office action. *See Genentech v. Wellcome Foundation*, 29 F.3d 1555, 1563-64, 31 USPQ2d 1161, 1167-68 (Fed. Cir. 1994).
>
> In order to make a rejection, the examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993) (examiner must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure). A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. Assuming that sufficient reason for such doubt exists, a rejection for failure to teach how to make and/or use will be proper on that basis. *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). As stated by the court, "it is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain why it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement. Otherwise, there would be no need for the applicant to go to the trouble and expense of supporting his presumptively accurate disclosure." 439 F.2d at 224, 169 USPQ at 370.
>
> According to *In re Bowen*, 492 F.2d 859, 862-63, 181 USPQ 48, 51 (CCPA 1974), the minimal requirement is for the examiner to give reasons for the uncertainty of the enablement. This standard is applicable even when there is no evidence in the record of operability without undue experimentation beyond the disclosed embodiments. *See also In re Brana*, 51 F.3d 1560, 1566, 34 USPQ2d 1436, 1441 (Fed. Cir. 1995) (citing *In re Bundy*, 642 F.2d 430, 433, 209 USPQ 48, 51 (CCPA 1981)) (discussed in MPEP § 2164.07 regarding the relationship of the enablement requirement to the utility requirement of 35 U.S.C. 101).
>
> While the analysis and conclusion of a lack of enablement are based on the factors discussed in MPEP § 2164.01(a) and the evidence as a whole, it is not necessary to discuss each factor in the written enablement rejection. The language should focus on those factors, reasons, and evidence that lead the examiner to conclude

> that the specification fails to teach how to make and use the claimed invention without undue experimentation, or that the scope of any enablement provided to one skilled in the art is not commensurate with the scope of protection sought by the claims. This can be done by making specific findings of fact, supported by the evidence, and then drawing conclusions based on these findings of fact. For example, doubt may arise about enablement because information is missing about one or more essential parts or relationships between parts which one skilled in the art could not develop without undue experimentation. In such a case, the examiner should specifically identify what information is missing and why one skilled in the art could not supply the information without undue experimentation. See MPEP § 2164.06(a). References should be supplied if possible to support a prima facie case of lack of enablement, but are not always required. *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). However, specific technical reasons are always required.

M.P.E.P. § 2164.04 (emphasis added).

With respect to the Examiner's burden under a rejection based on the written description requirement, the M.P.E.P. provides

> The inquiry into whether the description requirement is met must be determined on a case-by-case basis and is a question of fact. *In re Wertheim*, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). A description as filed is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption. See, e.g., *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). The examiner, therefore, must have a reasonable basis to challenge the adequacy of the written description. The examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. *Wertheim*, 541 F.2d at 263, 191 USPQ at 97.

M.P.E.P. § 2163.04 (emphasis added).

With regard to the subject matter of claims 11, 17-21, 61 and 67-70, the Office Action asserts that "[t]he Specification lacks written description for" the claimed features. However, the Office Action rejects these claims under the enablement requirement of 35 U.S.C. § 112, first paragraph, rather than the written description requirement this section of 35 U.S.C. *See Office Action*, section 3. As noted above, "the enablement requirement of 35 U.S.C. 112, first paragraph, is separate and distinct from the [written] description requirement." *M.P.E.P.* § 2164 (citing *Vas-Cath, Inc. v. Mahurkar*)(emphasis added). Thus, it is respectfully submitted that the Office Action errs in its assertion that claims 11, 17-21, 61 and 67-70 fail to comply with the

enablement requirement solely on the basis of an alleged lack of written description. Nevertheless, in an effort to advance the present application, the Office's informal written description discussion is addressed in the following. However, should the Office intend to issue a formal written description requirement rejection even in view of the ample evidence of sufficient written description provided below, the Applicants note that this would be a new grounds of rejection and another Office Action therefore should be issued.

Turning to the present application, claim 17 recites the features of wherein: the quantization ratio includes a first constant value when the expected amount of video data is greater than a first indicator; the quantization ratio includes a second constant value when the expected amount of video data is less than the first indicator and greater than a second indicator; and the quantization ratio is determined from a non-linear function when the expected amount of video data is less than the second indicator. Claims 21 and 67 recite similar features. Referring to Figure 5 and its corresponding passage, the present application teaches that the fullness of the video buffer is compared to a first indicator value X (e.g., the claimed "first indicator") at sub-step 530 and to a second indicator value Z (e.g., the claimed "second indicator") at sub-step 540. *Present Application*, p. 13, lines 1-2 and 23-25. In the event that the buffer fullness is less than the first indicator value X and greater than the second indicator value Z, the quantization ratio is set to a constant value Y (e.g., the claimed "second constant value") at subset 535 and is not further modified at sub-steps 550 and 555. *Id.*, p. 13, lines 4-6 and 26-29. In the event that the buffer fullness is greater than the first indicator value X (e.g., greater than the first indicator), the quantization ratio "can be set as high as necessary (e.g., larger than 1.0) at sub-steps 515 and/or 525 to avoid overflow of the target video buffer" (e.g., set to the claimed "first constant value," where the first constant value is the maximum or "high as necessary" quantization ratio value). *Id.*, p. 13, lines 14-18. In the event that the buffer fullness is less than the second indicator value Z (e.g., less than the second indicator), the non-linear function at p. 14, line 1 is applied to the quantization ratio in sub-step 545. *Id.*, p. 13, line 26 – p. 14, line 16.

Thus, as described above, the detailed description section of the present application provides sufficient written description for the claimed subject matter. Moreover, the Applicants note that the claims are part of the specification and therefore can provide written description support. With respect to claims 17, 21 and 67, the text of these claims is self-explanatory and

unambiguous and therefore the claims themselves provide sufficient written description even if it was assumed, *arguendo*, that there is an absence of sufficient written description in the detailed description section of the present application.

Claims 18 and 68 recite the features of wherein the first indicator is a buffer fullness value of 75% +/-1% of a maximum buffer fullness and claims 19 and 69 recite the features of wherein the second indicator is a buffer fullness value of 20% +/- 1% of a maximum buffer fullness. Claim 20 and 70 recite a particular equation that can be used as the non-linear function feature of claims 18 and 67. The passage of the present application at page 13, lines 19-26 discloses the claimed features of claims 18, 19, 68 and 69 and the passage at page 14, line 1-16 discloses the claimed features of claims 20 and 70. Moreover, the text of claims 18-20 and 68-70 is self-explanatory and unambiguous and these claims themselves provide sufficient written description even if it is assumed, *arguendo*, that there is an absence of sufficient written description in the detailed description section of the present application.

As the discussion above illustrates, the Applicants have demonstrated that there is sufficient written description and enablement for the claimed subject matter of pending claims 17-21 and 67-70. In contrast, the Office has not provided sufficient support for its assertion that claims 17-21 do not have sufficient written description and enablement. As noted above, the burden lies on the Office to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright*, 999 F.2d 1557. With respect to the written description requirement, "[t]he examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims." *M.P.E.P.* § 2163.04 (citing *Wertheim*, 541 F.2d at 263, 191 USPQ at 97). It is respectfully submitted that the Office has failed to meet either burden. At page 4, the Office Action makes the general assertion that the present application lacks written description for specific claim features, but the Office Action fails to provide any rationale or evidence in support of the enablement rejection of these claims. Rather, at page 3, the Office Action merely states that the specification has been reviewed in light of the Applicants' previous comments and the Examiner remains unable to find adequate written description for the subject matter of the rejected claims. The mere statement that written description is lacking for these claims, without more, would hardly be considered a preponderance of evidence in support of a

written description rejection. Accordingly, it is respectfully submitted that the Office has failed establish a *prima facie* case for its assertion that the present application is lacking enablement or sufficient written description for pending claims 17-21 and 67-70.

In view of the foregoing, it is respectfully submitted that the enablement/written description rejection is improper. Reconsideration and withdrawal of this rejection therefore is respectfully requested.

Indefinite Rejection of Claims 66-70

At page 4 of the Office Action, claims 66-70 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claim 66 has been amended consistent with the Examiner's suggestion. Reconsideration and withdrawal of this rejection therefore is respectfully requested.

Anticipation Rejection of Claims 1-8, 51-57, and 59

At page 5 of the Office Action, claims 1-8, 51-57, and 59 are rejected under 35 U.S.C. § 102(e) as being anticipated by Furukawa (U.S. Patent No. 6,834,080). This rejection is respectfully traversed.

As noted above, claim 1 has been amended to recite all of the additional subject matter of allowable claim 12 and intervening claim 10 and claim 51 has been amended to recite all of the additional subject matter of allowable claim 62 and intervening claim 60. Claims 1 and 51 therefore are allowable for at least the same reasons that claims 12 and 62 are allowable. Claims 2-8, 52-57 and 59 also are allowable at least by virtue of their dependency from one of claims 1 and 51.

New claim 71 has the same scope as previously presented claim 3. Claim 71 recites the feature of wherein a first quantization value is received from a source of a first macroblock. With respect to claim 3, the Office Action asserts that element 32 of Figure 1 of Furukawa discloses this claimed feature. Furukawa teaches that element 32 is an "encoded parameter generator 32" that generates encoded parameters 131, which include a quantization width QP. *See, e.g., Furukawa*, col. 5, lines 43-51. However, Furukawa fails to disclose that the encoded parameter generator 32 is a source of a first macroblock as recited in claim 71 (previous claim 3). Thus, even if it is assumed, *arguendo,* that the quantization width QP is the claimed first

quantization value, Furukawa fails to disclose, or even suggest, that a first quantization value is received from a source of a first macroblock as recited by claim 71. Furukawa therefore fails to disclose each and every feature recited by claim 71.

New claims 72 and 73 have the same scope as previously presented claims 7 and 8, respectively. With respect to claim 7, the Office Action asserts that element 21 of Figure 1 of Furukawa discloses the claimed feature of wherein an expected amount of video data in a video buffer is determined based on a modeling of the video buffer. The Applicants respectfully disagree.

Furukawa discloses a technique whereby a video signal 101 is encoded twice. The video feature calculator 31 calculates particular video feature amounts 130 for the video file and the encoded parameter generator 32 generates encoded parameters 131, including a frame rate FR and a quantization width QP, based on the video feature amounts. *Furukawa*, col. 5, lines 9-50. During the first encoding, the video signal 101 is encoded based on the generated encoded parameters 131 and the resulting encoded bit stream 111 is stored in the buffer 21. *Id.*, col. 5, line 52 to col. 6, line 2. Further, the number-of-encoded-bit-determination section 33 determines a shortage or excess of bits by comparing the number of generated bits 133 of the encoded bit stream 111 with a target number of bits 134 provided by a user. *Id.* col. 6, lines 3-6. The encoded parameter corrector 34 modifies the encoded parameters 131 and the video signal 101 is encoded a second time using the modified encoded parameters 131. *Id.*, col. 6, lines 6-8. If the difference between the number of generated bits 133 of the encoded bit stream 111 resulting from the second encoding is within a threshold of the target number of bits 134, the encoded bit stream 111 is output from the buffer 21 as encoded output 200. *Id.*, col. 6, lines 9-22.

In view of the above-described technique, the Office Action asserts that the number of bits 133

> represents the buffer delay value, which is based on a number of frames stored in video buffer 21 and is determined on a modeling of the video buffer, and the expected amount of video data output from the video buffer 21 is determined based on a modeling of the video buffer (see column 5, lines 51-60, column 6, lines 3-8). In other words, since the expected amount of video data output from the video buffer 21 is dependent on the [number of]generated bits 133 meeting a certain criteria (see column 6, lines 9-22, column 11, lines 47-63, column 12, lines

26-34), Furukara anticipates the features of wherein the expected amount of video data is determined based on a modeling of the video buffer.

Office Action, p. 12.

The Applicants respectfully disagree. As a first issue, the number of generated bits 133 is the size of the encoded bit stream 111 stored in the buffer 21 and output as the encoded output 200, so the number of generated bits 133 is the "amount of video data output from the video buffer 21" once the decision is made to output the encoded bit stream 111 based on the threshold comparison of the number of generated bits 133 to the target number of bits 134. Thus, the number of generated bits 133 is the actual amount of video data in the buffer 21, rather than an expected amount of video data in a video buffer as provided by claim 72.

As a second issue, Furukawa fails to disclose that the number of generated bits 133 (i.e., the amount of data in the buffer 21) is determined based on a modeling of the buffer 21. As will be appreciated from the exemplary definitions provided herein as Appendix A, a model is a representation or theoretical construct of something, so one of ordinary skill in the art will appreciate that a modeling of a video buffer includes the use of a representation or theoretical construct of the video buffer. Furukawa fails to disclose or suggest that the number of generated bits 133 (i.e., the amount of data in the buffer 21) is determined based on a representation or theoretical construct of the buffer 21. In fact, Furukawa fails to disclose that the buffer 21 is considered in any manner other than to simply store the encoded bit stream 111 until it is enabled for output as encoded output 200. Accordingly, as Furukawa discloses that the number of generated bits 133 is the actual, rather than expected, amount of video data in the buffer 21 and as Furukawa fails to disclose, or even suggest, a modeling of the buffer 21, Furukawa fails to disclose, or even suggest, the claimed feature of wherein the expected amount of video data in the video buffer is based on a modeling of the video buffer as recited by claim 72.

Dependent claim 73 has the same scope as claim 8. Claim 73 recites the additional features of wherein the modeling of the video buffer includes determining a fullness of the video buffer based on a difference between an input rate and an output rate. As noted above, the Office considers the buffer 21 of Figure 1 of Furukawa to be equivalent to the claimed video buffer feature. However, as also noted above, Furukawa discloses only that the buffer 21 is used to

stored the encoded bit stream 111 before it is output as encoded output 200. Thus, while Furukawa discloses the determination of the actual amount of data input into the buffer 21 (i.e., the number of generated bits 133), Furukawa fails to disclose an input rate or an output rate for the encoded bit stream 111 with respect to the buffer 21 and therefore fails to disclose a difference between an input rate and an output rate. Furukawa therefore necessarily fails to disclose that the fullness of the buffer 21 is based on a difference between an input rate and an output rate as provided by claim 73.

New claims 75 and 76 recite similar subject matter as claims 72 and 73, respectively. Furukawa therefore fails to disclose each and every feature recited by these claims for at least the same reasons as provided with respect to claims 72 and 73.

In view of the foregoing, it is respectfully submitted that the anticipation rejection is improper. Reconsideration and withdrawal of this rejection therefore is respectfully requested.

Obviousness Rejection of Claims 9 and 58

At page 7 of the Office Action, claims 9 and 58 are rejected under 35 U.S.C. §103(a) as being unpatentable over Furukawa in view of Legall (U.S. Patent No. 5,929,916). This rejection is respectfully traversed.

As noted above, claims 9 and 58 depend from allowable claims 1 and 51, respectively, and therefore are allowable at least by virtue of this dependency.

New claims 74 and 76 have the same scope as previously presented claims 9 and 58. Claims 74 and 76 recite the feature of wherein modeling of the video buffer includes using a VBV buffer model. The Office Action asserts that Legall discloses a VBV buffer model and one of ordinary skill in the art would be motivated to implement the VBV buffer model in the system of Furukawa to arrive at each and every feature of previously presented claim 9 (and new claim 74). Specifically, the Office Action acknowledges that neither Furukawa nor Legall specifically suggest their combination but then appears to assert that the motivation to combine Furukawa and Legall can be gleaned from the knowledge of one of ordinary skill in the art. *See Office Action*, p. 13. More specifically, the Office Action asserts that "it is nevertheless considered obvious to provide the VBV buffer modeling system of Legall as part of the video encoding as

shown in Figure 1 of Furukawa for the purposes of VBV buffer occupancy level control of the output buffer of a video encoder thereby preventing overflows and underflows." *Id.* It is respectfully submitted that the Office errs in its assumption of the knowledge of one of ordinary skill in the art with respect to the combination of the teachings of Furukawa and Legall.

As demonstrated by the statements at pages 13 and 14 of the Office Action, the Office proposes using the VBV buffer modeling system of Legall to model the output buffer of the video encoder of Furukawa. One of ordinary skill in the art will recognize, however, that VBV buffer modeling is used to model the input buffer of a video decoder. As discussed in the documents provided as Appendix B, it typically is assumed that a video encoder system will not have means to directly determine the fullness state of the input buffer of the video decoder that is receiving the encoded output of the video encoder. Thus, VBV buffer modeling is used at the video encoder to create a representation or theoretical construct of the input buffer of the video decoder so that the video encoder can throttle its output based on any expected underflows or overflows of the input buffer of the video decoder that are determined from the VBV buffer model. The teachings of Legall are consistent with this description. *See, e.g., Legall*, col. 4, lines 15-23 (stating "the encoder maintains a model of the decoder buffer. This model maintained by the encoder is known as the video buffer verifier (VBV) buffer. The VBV buffer models the decoder buffer occupancy")(emphasis added).

In the system of Furukawa, the video encoder has direct access to the buffer 21 and therefore directly determines the actual fullness state of the buffer 21 as the number of generated bits 133. Thus, in view of the direct buffer access afforded by Furukawa, in view of the well-known use of VBV buffer modeling to model the input buffer of a video decoder, and in view of the fact that Furukawa fails to disclose a video decoder and its input buffer, the knowledge of one of ordinary skill in the art would provide no suggestion for the use of the VBV *decoder* buffer modeling of Legall to model the video *encoder* buffer of Furukawa. Accordingly, the Office Action fails to establish a *prima facie* case of obviousness for claims 74 and 76 in view of Furukawa and Legall.

In view of the foregoing, it is respectfully submitted that the obviousness rejection is improper. Reconsideration and withdrawal of this rejection therefore is respectfully requested.

Obviousness Rejection of Claims 10, 15, 16, 60, 65, and 66.

At page 7 of the Office Action, 10, 15, 16, 60, 65, and 66 are rejected under 35 U.S.C. §103(a) as being unpatentable over Furukawa in view of Kan (Low-Complexity and Low-Delay Video Transcoding for Compressed MPEG-2 Bit stream). This rejection is respectfully traversed.

Claims 10, 15, 16 depend from allowable claim 1 and claims 60, 65 and 66 depend from allowable claim 51. Claims 10, 15, 16, 60, 65 and 66 therefore are allowable at least by virtue of this dependency. Reconsideration and withdrawal of this rejection therefore is respectfully requested.

Conclusion

The Applicants respectfully submit that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number in order to expedite resolution of any issues and to expedite passage of the present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-1835.

Respectfully submitted,

7 April 2006

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APPENDIX A

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define: model Search Advanced Search Preferences

Web

Related phrases: digital elevation model data model conceptual model information model color model osi model document object model hidden markov model component object model business model

Definitions of **model** on the Web:

- a hypothetical description of a complex entity or process; "the computer program was based on a model of the circulatory and respiratory systems"
- a type of product; "his car was an old model"
- a person who poses for a photographer or painter or sculptor; "the president didn't have time to be a model so the artist worked from photos"
- plan or create according to a model or models
- the act of representing something (usually on a smaller scale)
- form in clay, wax, etc; "model a head with clay"
- exemplar: something to be imitated; "an exemplar of success"; "a model of clarity"; "he is the very model of a modern major general"
- assume a posture as for artistic purposes; "We don't know the woman who posed for Leonardo so often"
- someone worthy of imitation; "every child needs a role model"
- a representative form or pattern; "I profited from his example"
- display (clothes) as a mannequin; "model the latest fashion"
- mannequin: a woman who wears clothes to display fashions; "she was too fat to be a mannequin"
- create a representation or model of; "The pilots are trained in conditions simulating high-altitude flights"
- construct a model of; "model an airplane"
- exemplary: worthy of imitation; "exemplary behavior"; "model citizens"

wordnet.princeton.edu/perl/webwn

- In mathematics, model theory is the study of the representation of mathematical concepts in terms of set theory, or the study of the models which underlie mathematical systems. It assumes that there are some pre-existing mathematical objects out there, and asks questions regarding how or what can be proven given the objects, some operations or relations amongst the objects, and a set of axioms.

en.wikipedia.org/wiki/Model_(logic)

- A model is a person who acts as a human prop for purposes of art, fashion, advertising, pornography, etc.

en.wikipedia.org/wiki/Model_(person)

- Model is a romatic thriller manhwa. Main characters include Jae, a beautiful young artist from Korea.

en.wikipedia.org/wiki/Model_(manwha)

- A physical model is used in various contexts to mean a physical representation of some thing. That thing may be a single item or object (for example, a bolt) or a large system (for example, the Solar System).

en.wikipedia.org/wiki/Model_(physical)

- In economics, a model is a theoretical construct that represents economic processes by a set of variables and a set of logical and quantitative relationships between them. As in other fields, models are simplified frameworks designed to illuminate complex processes.

en.wikipedia.org/wiki/Model_(economics)

- A model in macroeconomics is designed to simulate the operation of a national or international economy in terms of factors including the total amount of goods and services produced, total income earned, the level of employment of productive resources, and the general behavior of prices.
  en.wikipedia.org/wiki/Model_(macroeconomics)

- An analytical tool (often mathematical) used by transportation planners to assist in making forecasts of land use, economic activity, travel activity and their effects on the quality of resources such as land, air and water.
  www.oahutrans2k.com/info/glossary/M.htm

- The model is the type of vehicle that was made by the manufacturer.
  www.autowarrantyadvice.com/warranty-dictionary.htm

- A representation of a set of components of a process, system, or subject area, generally developed for understanding, analysis, improvement, and/or replacement of the process [GAO]. A representation of information, activities, relationships, and constraints [Treasury Enterprise Architecture Framework].
  www.ichnet.org/glossary.htm

- A representation of some aspect of external reality in a program.
  www.adaic.org/docs/craft/html/glossary.htm

- Mathematical use of data to project experimental results. A small imitation of the real thing; a system of postulates, data, and inferences presented as a mathematical description of an entity or state of affairs.
  www.knowledgebank.irri.org/glossary/Glossary/M.htm

- (1) A person that serves as a target subject for a learner to emulate. (2) A representation of a process or system that show the most important variables in the system in such a way that analysis of the model leads to insights into the system.
  www.neiu.edu/~dbehrlic/hrd408/glossary.htm

- a representation or simulation of something that cannot be directly observed
  www.ngdir.ir/SiteLinks/Kids/html/g001_GPS_____M.htm

- in science, a representation such that knowledge concerning the model offers insight about the entity modelled. Whether models are heuristic devices or essential features of scientific explanation is a matter of debate. Mathematical models are interpretations of a formal system assigning truth values to the formulae of the system, thus testing the system for con-sistency.
  www.filosofia.net/materiales/rec/glosaen.htm

- A simplified representation or description.
  cedar.web.cern.ch/CEDAR/glossary.html

- An interpretation in which expressions of interest to us (eg a wff, a set of wffs, a system) come out true for that interpretation. See Interpretation; isomorphism of models; true for an interpretation.
  www.earlham.edu/~peters/courses/logsys/glossary.htm

- A representation of a real physical system.
  highered.mcgraw-hill.com/sites/0072480823/student_view0/glossary.html

- Something that is used as the foundation for a similar idea or process.

science.education.nih.gov/supplements/nih2/oral-health/other/glossary.htm

- refers to the overall design of the watch movement. Waltham's model numbers generally correspond to the year in which the watch was designed or first introduced (eg, "77" refers to the "Model 1877," which was first introduced in 1877; "83" refers to the"Model 1883," which was first introduced in that year, etc.).
  www.nawcc-info.org/WalthamDB/Glossary.htm

- This is a simplified description of reality. They are used for prediction and control purposes and help us to improve our understanding of the behavioural characteristics of reality studied in a more effective way than if it had been observed directly.
  www.gruposantander.com/pagina/indice/0,,651_3_2,00.html

- A mathematical description of a biological phenomenon.
  www.fao.org/docrep/003/X3910E/X3910E16.htm

- A [verb] and a noun. [Generate] a mathematical representation (eg, number, graph, matrix, equation(s), geometric figure) for real world or mathematical objects, properties, actions, or relationships.
  www.dpi.state.wi.us/dpi/standards/mathglos.html

- A multidimensional structure including calculation rules and data.
  www.olapreport.com/glossary.htm

- Mathematical relationship which relates changes in a given response to changes in one or more factors.
  www.itl.nist.gov/div898/handbook/pri/section7/pri7.htm

- For the Department of Ethnography, the term FIGURE should be entered as an additional keyword if the model is of an animate subject.
  www.mda.org.uk/bmobj/Obthesm3.htm

- an abstraction or simplification of reality; a subset of the most critical components of the system being modeled. Models may be conceptual or mathematically expressed. Models are often used in evaluation to quantify outputs. Example: Habitat Suitability Index (HSI) model, Ecological Dynamics Simulation (EDYS), Hydrological Simulation Program – FORTRAN (HSPF), Hydrologic Engineering Center River Analysis System (HEC-RAS).
  ecosurvey.gmu.edu/glossary.htm

- a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. Natural environment - the earth-based environment modeled by an environment.
  www.sedris.org/glossary.htm

- a physical or mathematical representation of a process that can be used to predict some aspect of the process.
  www.dnr.state.mn.us/water/hydroterms.html

- A method of expressing relationships when measuring the real world is impractical.
  www.mc2consulting.com/riskdef.htm

- A prototype or surrogate of a complex situation. It can be a physical model, such as an architectural model of urban design, or a mathematical model of interactions of many variables. It is used in simulations for relating various components together or can be a stand alone tool to evaluate different approaches using different assumptions. ...
  ag.arizona.edu/futures/home/glossary.html

- something built or drawn to show how something much larger would look
  www3.newberry.org/k12maps/glossary/

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APPENDIX B

VBV - Video Buffering Verifier

The Video Buffer Verifier (VBV) is a model hypothetical decoder buffer that will not overflow or underflow when fed a conforming MPEG bit stream. Thus, part of the *definition* of a compliant stream is that it does not cause underflow or overflow of this model buffer. The quantities that MPEG transmits to specify decoder buffer action according to this model are explained fully below. However, decoders do not have to use these quantities, but instead can rely on redundant information provided by time stamps. A thorough explanation is in the section on Buffer Synchronization and Startup .

Operation of the VBV is tied to two transmitted values, vbv_buffer_size_value, the maximum buffer fullness, and vbv_delay, the delay between storing a picture start code in the buffer and starting the decoding of that picture. vbv_buffer_size is transmitted in every sequence header. vbv_delay is transmitted in every picture header. Note that the sequence header and vbv_buffer_size may not be available when tuning to a program in progress. However, proper operation of the decoder buffer can be obtained by use of the System Time Clock and various time stamps and an a priori knowledge of the maximum buffer size that may be required, so that vbv_delay and vbv_buffer size are redundant.

In the ATSC standard A/53 Annex A, the constraint on buffer size is:

maximum video buffer = B = 7995392 bits,

which is specified by transmitting:

vbv_buffer_size_value <= 488 (lower 10 bits of vbv_buffer_size)

vbv_buffer_size_extension = 0 (upper 8 bits of vbv_buffer_size)

where B = 16*1024*vbv_buffer_size.

The ATSC constraint on vbv_delay is

vbv_delay <= 45000

vbv_delay is a 16 bit unsigned integer representing the number of 90kHz clock periods between entering a picture's start code into the buffer and removing and decoding the entire picture.

Previous: Multiplexed Programs

Next: Buffer Synchronization and Startup

Up to Timing and Buffer Control